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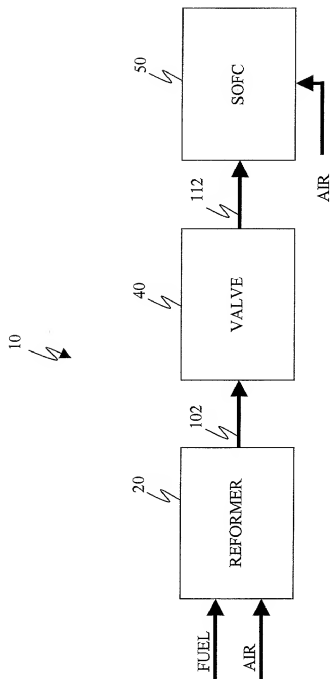


FIG. 1

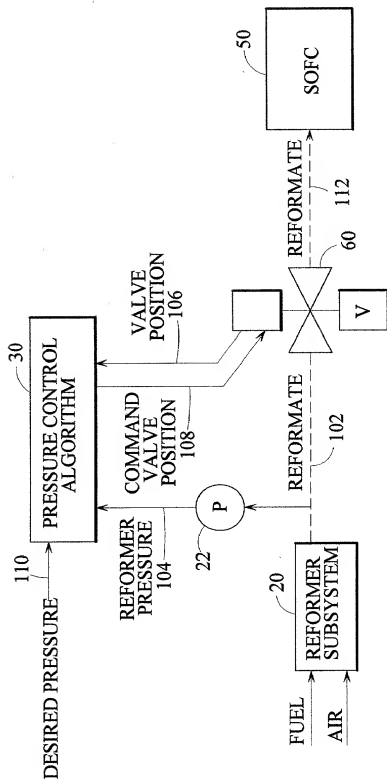
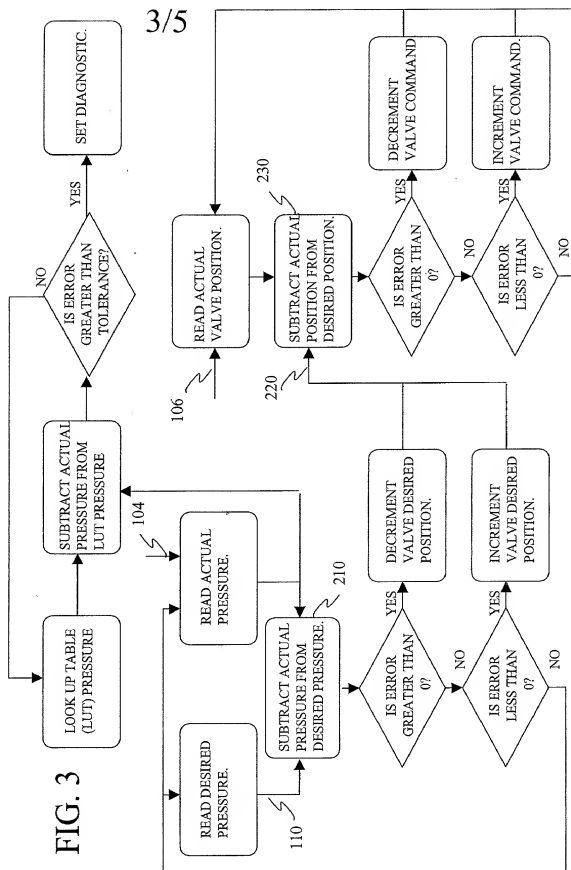


FIG. 2

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FIG. 3



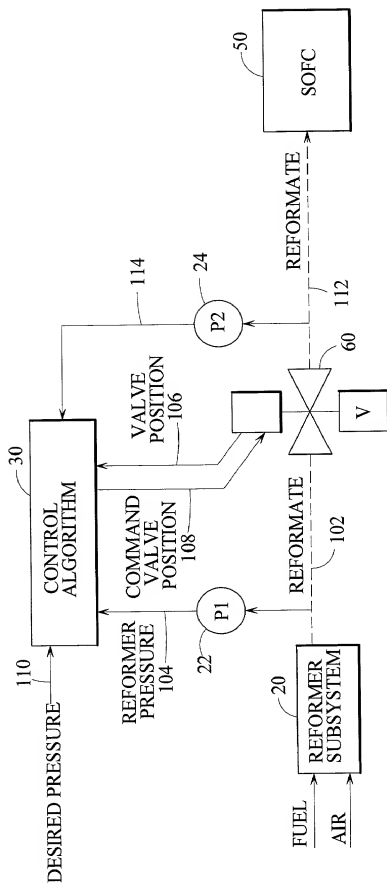


FIG. 4

FIG. 5

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graph TD
    104[READ UPSTREAM PRESSURE] --> 114[READ DOWNSTREAM PRESSURE]
    114 --> 402[SUBTRACT UPSTREAM PRESSURE FROM DOWNSTREAM PRESSURE.]
    402 --> 404[MASS FLOW LOOK UP TABLE]
    404 --> 106[SUBTRACT ACTUAL MASS FLOW FROM LUT MASS FLOW]
    106 --> 110{IS ERROR GREATER THAN TOLERANCE?}
    110 -- YES --> 112[SET DIAGNOSTIC.]
    110 -- NO --> 106
    106 --> 410[READ DESIRED MASS FLOW.]
    410 --> 412[SUBTRACT ACTUAL MASS FLOW FROM DESIRED MASS FLOW.]
    412 --> 414{IS ERROR GREATER THAN 0?}
    414 -- YES --> 416[DECREMENT VALVE DESIRED POSITION.]
    414 -- NO --> 418{IS ERROR LESS THAN 0?}
    416 --> 420[INCREMENT VALVE DESIRED POSITION.]
    418 -- YES --> 422[DECREMENT VALVE DESIRED POSITION.]
    418 -- NO --> 424{IS ERROR GREATER THAN 0?}
    424 -- YES --> 426[DECREMENT VALVE COMMAND.]
    424 -- NO --> 428{IS ERROR LESS THAN 0?}
    428 -- YES --> 430[INCREMENT VALVE COMMAND.]
    428 -- NO --> 432[READ ACTUAL VALVE POSITION.]
    432 --> 434[SUBTRACT ACTUAL POSITION FROM DESIRED POSITION.]
    434 --> 436{IS ERROR GREATER THAN 0?}
    436 -- YES --> 438[DECREMENT VALVE COMMAND.]
    436 -- NO --> 440{IS ERROR LESS THAN 0?}
    440 -- YES --> 442[INCREMENT VALVE COMMAND.]
    440 -- NO --> 432
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The flowchart illustrates a control system for a valve. It begins with reading upstream pressure (104) and downstream pressure (114). The downstream pressure is subtracted from the upstream pressure (402) to determine a pressure difference. This difference is used to look up a mass flow value from a table (404). The actual mass flow is then subtracted from this LUT mass flow (106) to find an error. If this error is greater than a tolerance (110), a diagnostic is set (112). If not, the desired mass flow is read (410). The actual mass flow is subtracted from the desired mass flow (412). If the error is greater than zero (414), the valve desired position is decremented (416). If the error is less than zero (418), the valve desired position is incremented (420). This process continues until the error is within the tolerance. Once the desired position is determined, the actual valve position is read (432). The actual position is subtracted from the desired position (434). If the error is greater than zero (436), the valve command is decremented (438). If the error is less than zero (440), the valve command is incremented (442). This process continues until the valve is at the desired position.